

Art Unit: 1727

SEPARATOR FOR FLAT-TYPE POLYMER ELECTROLYTE FUEL CELLS

Examiner: Adam Arciero

S.N. 10/584,902

Art Unit 1727

August 25, 2011

Detailed Action

1. **This supplemental action is a correction to the original Notice of Allowance mailed on June 23, 2011**
2. The Applicant's response filed on June 01, 2011 was received. Claims 1-3 and 16 are currently pending.
3. The text of those sections of Title 35, U.S.C. code not included in this action can be found in a prior Office action.

EXAMINER'S AMENDMENT

4. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.
5. Authorization for this examiner's amendment was given in a telephone interview with Mr. Dan Crane on August 15, 2011.

The application has been amended as follows:

Independent claim 1 is amended to add "...including unit cells arrayed in a flat configuration, the flat-type polymer electrolyte fuel cell..." into the preamble, lines 2 and

Art Unit: 1727

3 of the claim, as well as fix a misplaced parenthesis in line 18 of the claim below. The amendments are emphasized with underline for clarification.

Claim 1 now recites: “A flat-type polymer electrolyte fuel cell including unit cells arrayed in a flat configuration, the flat-type polymer electrolyte fuel cell comprising:

a fuel-feed-side separator; and

an oxygen-feed-side separator,

each of the fuel-feed-side separator and oxygen-feed-side separator comprise:

a collector portion including n unit conductive substrates wherein n is an integer of 2 or more, each conductive substrate having a plurality of through-holes through which fuel or oxygen passes, the conductive substrates are arrayed in a flat configuration via gaps,

and a pair of insulating frames which have n openings in alignment with an array position of said unit conductive substrates and are integrated in such a way as to hold the collector portion therebetween, wherein

1st to (n-1)th unit conductive substrates of the n unit conductive substrates that form the collector portion in one of the fuel-feed-side separator or the oxygen-feed-side separator, as counted from an end of an array direction thereof, and 2nd to nth unit conductive substrates of the n unit conductive substrates that form the collector portion in another of the fuel-feed-side separator or the oxygen-feed-side separator, as counted from the end of the array direction thereof are successively joined together by (n-1) connecting hinges;

wherein the conductive substrates of the fuel-feed-side separator and the oxygen-feed-side separator and the (n-1) connecting hinges are the same material.”(Emphasis

Art Unit: 1727

added for amendments).

Claim Rejections - 35 USC § 112

6. The claim rejections under 35 U.S.C. 112, first paragraph on claim 15 is withdrawn, in light of Applicant's arguments.

Claim Rejections - 35 USC § 102

7. The claim rejections under 35 U.S.C. 102(b) as being unpatentable over Maeda et al. on claims 1 and 16 is withdrawn, in light of the Examiner's amendments to the independent claim.

Claim Rejections - 35 USC § 103

8. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Maeda et al. and Hayashi on claim 3 is withdrawn, in light of the Examiner's amendments to the independent claim.

Reasons for Allowance

9. Claims 1-3 and 16 are allowed. The following is the Examiner's statement of reasons for allowance: The invention of independent claim 1 recites: "A flat-type polymer electrolyte fuel cell including unit cells arrayed in a flat configuration, the flat-type polymer electrolyte fuel cell comprising:

a fuel-feed-side separator; and

an oxygen-feed-side separator,

each of the fuel-feed-side separator and oxygen-feed-side separator comprise:

a collector portion including n unit conductive substrates wherein n is an integer of 2 or more, each conductive substrate having a plurality of through-holes through which fuel or oxygen passes, the conductive substrates are arrayed in a flat configuration via gaps,

and a pair of insulating frames which have n openings in alignment with an array position of said unit conductive substrates and are integrated in such a way as to hold the collector portion therebetween, wherein

1^{st} to $(n-1)^{\text{th}}$ unit conductive substrates of the n unit conductive substrates that form the collector portion in one of the fuel-feed-side separator or the oxygen-feed-side separator, as counted from an end of an array direction thereof, and 2^{nd} to n^{th} unit conductive substrates of the n unit conductive substrates that form the collector portion in another of the fuel-feed-side separator or the oxygen-feed-side separator, as counted from the end of the array direction thereof are successively joined together by $(n-1)$ connecting hinges;

wherein the conductive substrates of the fuel-feed-side separator and the oxygen-feed-side separator and the $(n-1)$ connecting hinges are the same material.”(Emphasis added for amendments).

The closest prior arts of record, Maeda et al. (WO 03/098726) and Hayashi et al. (US 2002/0146610 A1) teach a separator for a flat-type polymer electrolyte fuel cell comprising unit cells arrayed in flat configuration, having both a fuel-feed side separator and an oxygen-feed side separator (Fig. 6b). Maeda et al. further discloses wherein said separators comprise collector portions having a plurality of conductive substrates **10** arrayed in a flat configuration via gaps **16** (Fig. 2b). Furthermore, said separators

Art Unit: 1727

comprise a pair of insulating frames which sandwich the collector portions therebetween (Fig. 12). Said gap **16** clearly separates the collector portion into separate conductive substrates. Said conductive substrates of the fuel side separator and oxygen side separator are joined together by means of a connecting hinge **41** (Fig. 6c). However, the prior arts do not disclose, teach or suggest wherein the conductive substrates of said fuel and oxygen side separators comprise connecting hinges that are of the same material.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 7am to 4pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on 571-272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1727

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Supervisory Patent Examiner, Art Unit 1727